

looking, on which the insects were very easily seen; on the best days ten or twelve were taken from this wall in as many minutes, and on the 18th I found five still on it at one p.m. in full sunshine. Some of the forms are olive-green—a form which seems peculiar to South Devon—whilst others approach the orange tint, for which Folkestone is famous. Altogether about fifty were taken, and it is possible to arrange them in an unbroken series from the colour of the typical *B. perla* to the dark olive-green. One fine large specimen was an exact reproduction in miniature of *Agriopsis aprilina*.

Two visits to Dawlish were made on the 12th and 21st respectively. On the 12th *Callimorpha hera* was just appearing, and ten specimens were taken—a few in perfect condition. The yellow form (*flavescens*) seems to have increased to nearly 40 per cent. of the captures, while the intermediate orange form is getting more numerous. It is possible to arrange a series graduated from crimson to yellow. On the 21st only four *hera* were taken, but it still seemed to be emerging; the ground was so thick with collectors that it was almost impossible at ten o'clock to find a hedge that had not already been beaten. On both days the hedges teemed with geometers, the best being *Zonosoma porata* and *Acidalia immitaria*. On the 21st a single specimen of *Colias edusa* was taken, so fresh that it had probably only just dried its wings. The afternoon was spent in the warren in search of *Mesotype virgata*; in spite of a strong east wind eleven were taken, but more than half were too worn to be of value.

Altogether seventy-seven different species were taken in three weeks, and many more could have been secured.

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A CONTRIBUTION TOWARDS A REVISION OF THE BRITISH TORYMINA.

BY P. CAMERON.

IN this paper I have only dealt with the species I have in my own collection, and mainly the species I have reared. It is really more a revision of the Scottish species; for, to prepare a thorough revision of the British species, it would be necessary to make a critical examination of the collection of the late Mr. Francis Walker, now in the British Museum. There is no British list with which a useful comparison can be made; but Thomson (Hymen. Scand. iv.) records fifty-nine species from Scandinavia, and Mayr, in his Monograph of the European species (Verh. z.-b. ges. Wien, xxiv.), describes seventy-eight

species. My work has been greatly facilitated, and the identity of the species placed beyond dispute, by the aid of a valuable series of types which I received from Prof. Gustav L. Mayr.

MONODONTOMERUS, *West.*

1. *M. obscurus*, *West.*

M. obscurus, Westwood, Phil. Mag. ii. 443; Mayr, Verh. z.-b. ges. Wien, xxiv. 68.

Callimone pubescens, Walker, Ent. Mag. i. 138.
New Forest.

2. *M. dentipes*, *Boh.*

Torymus dentipes, Boheman, Vet. Ac. Handl. 1833, 335.

Monodontomerus dentipes, Walker, Ent. Mag. ii. 158? ;
Thomson, Hym. Scand. iv. 67.

One specimen from Mr. J. E. Fletcher taken on the windows of his house at Worcester.

DIOMORUS, *Walk.*

3. *Diomorus armatus*, *Boh.*

Torymus armatus, Boh. Vet. Ac. Handl. 1833, 336.

Diomorus nobilis, Walker, Ent. Mag. ii. 159; Thoms. Hym. Scand. iv. 72, 1.

One example; Clydesdale. Bramble-stems.

SYNTOMASPIS, *Foer.*

Syntomaspis, Foerster, Hym. Stud. ii. 43.

4. *Syntomaspis saphirina*, *Boh.*

Torymus saphirinus, Boheman, Vet. Ac. Handl. 1833, 371.

T. caudatus, Nees, Hym. Ich. Aff. Mon. ii. 60.

Callimone affinis, Walker, Ent. Mag. 1833, 133.

C. littoralis, Walker, *l. c.* 134.

Syntomaspis saphirina, Thomson, Hym. Scand. iv. 75, 3.

Common in galls of *Andricus terminalis*.

5. *Syntomaspis pubescens*, *Foer.*

Torymus pubescens, Foerster, Beitr. z. Mon. d. Ptero. p. xxx.

Two examples bred from galls of *Rhodites eglanteriæ*; Clydesdale. Not hitherto recorded as British.

6. *Syntomaspis fastuosa*, *Boh.*

Torymus fastuosa, Boheman, Vet. Ac. Handl. 1833, 347.

Callimone notatus, Walker, Ent. Mag. i. 134.

Syntomaspis fastuosa, Mayr, Verh. z.-b. ges. Wien, xxiv. 78;
Thoms. Hym. Sc. iv. 73.

Cladich, Loch Awe, June.

7. SYNTOMASPIS CYANEA, *Boh.*

Torymus cyaneus, Boheman, Vet. Ac. Handl. 1833, 366.

Callimone eurynotus, Walker, Ann. Mag. Nat. Hist. v. (2) 126.

Syntomaspis cyanea, Mayr, Verh. z.-b. ges. Wien, xxiv. 79;
Thoms. Hym. Sc. iv. 74.

Not uncommon in galls of *Dryophanta longiventris*.

OLIGOSTHENUS, *Foer.*8. OLIGOSTHENUS STIGMA, *Fab.*

Ex Bedeguar galls, Cheshire.

HOLASPIS, *Mayr.*

Holaspis, Mayr (*non* Gray), Verh. z.-b. ges. Wien, xxiv. 83.

9. HOLASPIS MILITARIS, *Boh.*

Torymus holaspis, Boheman, Vet. Ac. Handl. 1833, 338.

Holaspis militaris, Mayr, z.-b. ges. Wien, xxiv. 85; Thomson, Hym. Sc. iv. 70.

This genus has not been recorded from Britain before. I owe its record to Dr. T. A. Chapman, who sent me some galls of *Aulax rhœadis* from Hereford, from which the species was reared.

TORYMUS, *Dal.*

Torymus, Dalman, Vet. Ac. Handl. 1820, 135; Mayr, Verh. z.-b. ges. Wien, xxiv.

Callimone, Walker, Ent. Mag. i. 119.

Thomson (Hym. Sc. iv. 60) separates *Callimone* from *Torymus* through differences in the mandibles, the form of the metathorax and of the costal cellule, but these differences appear to me to merge so much into each other that I can hardly look upon them as of generic value. Thomson's *Callimone* represents the Section A of Mayr's Monograph.

10. TORYMUS ERUCARUM, *Schr.*

Ichneumon erucarum, Schrank, Enum. Ins. Austr.

Torymus fulgidus, Boheman, Vet. Ac. Handl. 1833, 345.

Callimone cynipedis, Walker, Ent. Mag. i. 119.

Torymus erucarum, Mayr, Verh. z.-b. ges. Wien, xxiv. 87;
Thoms. Hym. Sc. iv. 86, 11.

Parton, Loch Ken, Clydesdale. Rare.

A parasite of *Aphilothrix radiceis*.

11. TORYMUS FULGENS, *Fab.*

Ichneumon fulgens, Fabr. Ent. Syst. Supp. 230.

Torymus fulgens, Nees, Hym. Ichn. Aff. Mon. ii. 61; Mayr, Verh. z.-b. ges. Wien, xxiv. 88.

Callimone rosaces, Walker, Ann. Mag. Nat. Hist. xxii. 88.

Rare. Clober, near Glasgow.

12. *TORYMUS CHRYSOCEPHALUS*, Boh.

Torymus chrysocephalus, Boheman, Vet. Ac. Handl. 1833, 340; Mayr, Verh. z.-b. ges. Wien, xxiv. 89.

Callimone rudis, Walker, Ent. Mag. iv. 25.

Rare. Bishopton.

13. *TORYMUS ABDOMINALIS*, Boh.

Torymus abdominalis, Boheman, Vet. Ac. Handl. 1833, 343; Mayr, Verh. z.-b. ges. Wien, xxiv. 9.

Callimone angelicæ, Walker, Ent. Mag. iv. 25.

Common in galls of *Biorhiza terminalis*, *Aphilothrix curator*, *Spathogaster baccarum*, *Dryophanta divisa*.

14. *TORYMUS NOBILIS*, Boh.

Torymus nobilis, Boheman, Vet. Ac. Handl. 1833, 339; Mayr, Verh. z.-b. ges. Wien, xxiv. 92.

Callimone roboris, Walker, Ent. Mag. i. 120.

C. regalis, Walker, l.c. 119.

C. subterraneus, Curtis, Brit. Ent. xii. t. 552.

Gloucester; London districts. Galls of *Aphilothrix radiceis*, *A. sieboldi* and *Biorhiza aptera*, all root galls.

15. *TORYMUS VENTRALIS*, Fonse.

Cynips ventralis, Fonse, Ann. Soc. Nat. xxvi. 286.

Callimone quadricolor, Walker, Ent. Mag. i. 120.

Torymus ventralis, Mayr, Verh. z.-b. ges. Wien, xxiv. 93.

T. affinis, Foerster, Beitr. z. Mon. d. Ptero. xxix.

Eccles, Dumfriesshire. Rare.

16. *TORYMUS REGIUS*, Nees.

Torymus regius, Nees, Hym. Ichn. Aff. Mon. 1834, 55; Mayr, Verh. z.-b. ges. Wien, xxiv. 95.

T. nigricornis, Boheman, Vet. Ac. Handl. 1833, 355.

Callimone inconstans, Walker, Ent. Mag. ii. 159.

C. lateralis, Walker, l.c. 159.

C. devoniensis, Parfitt, Zool. 1856, 5074.

Common. Galls of *Cynips kollari*, *Biorhiza terminalis*, *Dryophanta folii*, *Spathogaster baccarum*.

17. *TORYMUS AZUREUS*, Boh.

Torymus azureus, Boheman, Vet. Ac. Handl. 1833, 369; Mayr, Verh. z.-b. ges. Wien, xxiv. 100; Thomson, Hym. Scand. iv. 84.

Perth; from fir-cones inhabited by *Eupithecia togata*.

18. *TORYMUS CAUDATUS*, Boh.

Torymus caudatus, Boheman, Vet. Ac. Handl. 1833, 365; Thomson, Hym. Scand. iv. 84.

A Scotch example without note of locality. Worcester; from cones of *Abies* (J. E. Fletcher).

Mayr unites *T. azureus* and *T. caudatus*, but Thomson regards them as extinct species. My examples appear to show a variation in the length of the ovipositor compared to the length of the body.

19. TORYMUS BEDEGUARIS, L.

Ichneumon bedeguaris, Linné, Syst. Nat. ii. 939.

Torymus försteri, Ratzburg, Ichn. d. Forstins, i. 1844, 178.

T. bedeguaris, Mayr, Verh. z.-b. ges. Wien, xxiv. 101; Thomson, Hym. Scand. iv. 87.

Rare in the "bedeguar" galls of *Rhodites rosæ*. Thomson, l. c., regards *T. druparum*, Boh. sec. Mayr, bred from the fruit of *Prunus scandica*; and *T. elegans*, Boh. sec. Mayr = *varians*, Walker, Ent. Mag. i. 122.

T. varians, Walker, I am inclined, if I have correctly identified my specimens, to regard as a good species, and probably, as Mayr suggests, identical with *T. elegans*, Boh. It seems the more likely of *T. varians* being distinct from the bedeguar species from its different habits, it being a parasite on willow *Cecidomyiæ*.

20. TORYMUS VALLISNIERII, sp. nov.

Viridis, abdomine supra cupreo, subtus testaceo; alis hyalinis; pedibus flavo-testaceis, tibiis posticis infuscatis.

Long. fere 2; terebra 2 mm.

Clydesdale; ex galls of *Nematus gallicola*, West. (*vallisnierii*, Htg.).

Scape of antennæ testaceous beneath; the flagellum shining, metallic purple, variegated with green; the third and fourth joints equal in length. Head dark purple, slightly variegated with green, shining, very minutely punctured. Thorax green, strongly and closely punctured, closely covered with a microscopic fuscous pubescence; the median segment almost impunctate, shining, bare, more purplish in tint than the mesonotum. Pleuræ green, closely punctured. Legs pallid yellow, the coxæ green, except at the apex, strongly punctured; the hinder femora in the middle distinctly, the hinder tibiæ slightly infuscated; the apex of the hinder tarsi infuscated; the longer spur of the hinder tibiæ scarcely one-fourth of the length of the metatarsus. Wings clear hyaline; the nervures yellow. Abdomen dark purple, except the basal segment, which is green, and the sides at the apex which are slightly tinted with green; the ventral surface at the base broadly testaceous; the rest green suffused with bronzy tints.

Comes nearest to *T. abbreviatus*, but that is a larger and stouter species, has the ovipositor longer, the thorax and abdomen much more bronzy and shining, the ventral surface not

testaceous, the legs are of a brighter colour, and the antennæ are not shining metallic.

No species of *Torymus* has been recorded from the galls of *Nematus gallicola*; but two species of *Eulophus* and one *Pteromalus* have been reared.

21. TORYMUS IGNICEPS, Mayr.

Verh. z.-b. ges. Wien, xxiv. 103.

I have a specimen from Clober Wood, which agrees with Mayr's description, as well as an English example, differing, however, somewhat from it.

22. TORYMUS ABBREVIATUS, Boh.

Torymus abbreviatus, Boheman, Vet. Ac. Handl. 1833, 357;

Mayr, Verh. z.-b. ges. Wien, xxiv. 105, 20.

T. euchlorus, Boh. l.c. 359.

Callimone chloromerus, Walker, Ent. Mag. i. 128.

C. æqualis, Walker, l.c. 129.

Torymus chlorinus, Foerster, Beitr. z. Mon. d. Pter. xxx.

Rare. Cadder Wilderness; in galls of *Cecidomyia rosæ*. It is a variable species.

23. TORYMUS FUSCIPES, Boh.

Torymus fuscipes, Boheman, Vet. Ac. Handl. 1833, 374;

Mayr, Verh. z.-b. ges. Wien, xxiv. 108.

Two Clydesdale examples identical with a type from Mayr.

Mayr considers *T. chlorocopes*, Boh., as identical with *T. fuscipes*; but Thomson (Hym. Scand. iv. 85) considers the two to be distinct. With the material at my command I am unable to give an opinion.

24. TORYMUS JUNIPERI, L.

Ichneumon juniperi, Linné, Fauna Suec. 408, 1635.

Diplolepis juniperi, Fab. Syst. Piez. 1804, 150.

Torymus amethystinus, Boheman, Vet. Ac. Handl. 370, 1833 ?; Thomson, Hym. Sc. iv. 85.

Common in galls of *Hormomyia juniperina*, L. Clober Moor, Dumbartonshire.

25. TORYMUS HIBERNANS, Mayr.

Verh. z.-b. ges. Wien, xxiv. 111, 26.

Rare. Clober; in galls of *Neuroterus lenticularis*, in which they are laid in the autumn.

26. TORYMUS TIPULARIARUM, Zett.

Torymus tipulariarum, Zetterstedt, Ins. Lappon. 420; Mayr, Verh. z.-b. ges. Wien, xxiv. 111.

T. pumilus, Ratzburg, Ichn. d. Forstins. i. 180.

In the "rose" galls of *Cecidomyia salicis*.

27. TORYMUS MACROPTERUS, Walker.

Callimone macroptera, Walker, Ent. Mag. i. 124.

Torymus purpurascens, Nees, Hym. Ich. Aff. Mon. ii. 517.

T. macropterus, Mayr, Verh. z.-b. ges. Wien, xxiv. 114, 31.

Galls of *Rhodites spinosissima*; Troon, Arran; sand-hills at New Brighton. In galls of *Diastrophus rubi*; Worcester (J. E. Fletcher).

28. TORYMUS AURATUS, Fons.

Cynips aurata, Fons. Ann. Sc. Nat. xxvi. 284.

Torymus viridissimus, Boheman, Vet. Ac. Handl. 1833, 358.

Callimone autumnalis and *C. confinis*, Walker, Ent. Mag. i. 125.

C. mutabilis, Walker, l.c. 127.

C. leptocerus, Walker, l.c. 129.

C. minutus, Walker, l.c. 137.

Torymus muscarum, Nees, Hym. Ich. Aff. Mon. ii. 58.

T. propinquus, Foerster, Beitr. z. Mon. d. Pter. xxx.; Ratzburg, Ich. d. Forstins, iii. 223.

T. appropinquans, Ratzburg, l.c. 179.

T. auratus, Mayr, Verh. z.-b. ges. Wien, xxiv. 115.

T. viridissimus, Thomson, Hym. Scand. iv. 90, 18.

Common in many oak galls:—*Biorhiza terminalis*, *Andricus inflator*, *A. curator*, *A. cirratus*, *A. ramuli*, *A. 4-lineatus*, *Spathogaster baccarum*, &c.

29. TORYMUS AMÆNUS, Boh.

Torymus amœnus, Boheman, Vet. Ac. Handl. 1833, 348; Mayr, Verh. z.-b. ges. Wien, xxiv. 117; Thomson, Hym. Sc. iv. 89, 15.

Callimone formosus, Walker, Ent. Mag. i. 122.

C. scutellaris, Walker, l.c. 123.

Torymus compressus, Foerster, Beitr. z. Mon. d. Pter. 1841, xxx.

Rare. In galls of *Aphlothrix radiceis* and *Trigonaspis megaloptera*. Clydesdale and Loch Awe.

30. TORYMUS SODALIS, Mayr.

Torymus sodalis, Mayr, Verh. z.-b. ges. Wien, xxiv. 120.

Not common. Clober; in galls of *Neuroterus lenticularis*.

31. TORYMUS DAUCI, Curt.

Callimone dauci, Curt. Brit. Ent. xii. 552.

Torymus dauci, Mayr, Verh. z.-b. ges. Wien, xxiv. 118.

New Forest. A parasite in *Cecidomyiæ* on *Pimpinella* and *Daucus*.

32. TORYMUS GALII, Boh.

Torymus galii, Boheman, Vet. Ac. Handl. 1833, 344; Mayr, Verh. z.-b. ges. Wien, xxiv. 121; Thomson, Hym. Scand. iv. 97, 31.

T. gracilis, Walker, Ent. Mag. i. 137.

Not common. Clydesdale; in galls of *Cecidomyia galii*, Winn.

33. *TORYMUS CAMPANULÆ*, *Cam.*

Torymus campanulæ, Cameron, Ent. Mon. Mag. 1880, 40.
Rare in galls of *Cecidomyia campanulæ*; Clydesdale.

34. *TORYMUS VIRIDIS*, *Foer.*

Torymus viridis, Foerster, Beitr. z. Mon. d. Ptero. p. xxx.
Rare. Clydesdale; in galls of *Rhodites eglanteriæ*.

35. *TORYMUS PRUNI*, *Cam.*

Torymus pruni, Cam. Trans. Ent. Soc. 1883, 196.
Milngavie; in galls of *Cecidomyia pruni*, Kalt.

VARIATION IN THE GENUS *EREBIA*.

BY GEOFFREY SMITH.

PART I.

DURING this and previous years I have collected this genus in the English Lake district, and in Savoy, with the purpose, shared by so many collectors, of studying its variability, and the problems connected therewith. The work of Dr. Chapman (Trans. Ent. Soc. 1898), who has based a means of identifying the different species by means of the gonapophyses of the male, has cleared the way for such studies, and is, I believe, absolutely reliable. It is a well-known fact that the various species of *Erebia* are extremely variable in their wing-facies; even when whole groups have been separated as persistent varieties from a type-species on the characters of their gonapophyses, &c., the various sub-groups or varieties are not at all homogeneous. There is great individual variability.

Side by side with this fact I should like to mention another fact even more striking, and that is the great preponderance of males over females in the majority of species. These two facts seem to me to be the leading facts with regard to the genus, and from habitually considering them together I have been led to suppose that there might be some causal connection between them. In trying to establish a causal connection between these two facts, it was necessary to treat the subject from a more or less statistical point of view; I have therefore used the means explained in Prof. Galton's 'Natural Inheritance' for drawing out a scheme of distribution of characters. The application of this scheme will become obvious during the course of this essay.

I have selected for the purpose in hand *Erebia epiphron* var. *cassiope*. This variety, in the regions in which I have studied it,